EXTERNAL IMBALANCES, GROSS CAPITAL FLOWS AND SOVEREIGN DEBT CRISSES

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EXTERNAL IMBALANCES, GROSS CAPITAL FLOWS, SOVEREIGN DEBT CRISSES

- Recent experience in the euro area
  - Current account imbalances
  - Expansion of gross external positions
    - Intermediation of capital flows
  - Sovereign debt crisis
    - Severe recession in Periphery, slow growth in Core
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- Did policy distortions in EMU contribute to these facts?
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  ▶ Current account imbalances
  ▶ Expansion of gross external positions
    ▶ Intermediation of capital flows
  ▶ Sovereign debt crisis
    ▶ Severe recession in Periphery, slow growth in Core

▶ Did policy distortions in EMU contribute to these facts?
  ▶ Implicit subsidies on cross-border asset holdings
  ▶ Financial regulation, bailout expectations
Current Account Imbalances

Core = AT, BE, DE, FR, NL. Periphery = EL, ES, IE, IT, PT. Source: OECD.
Bilateral NFA Positions - Intermediation

Bilateral Net Foreign Assets of France

% of EA GDP

Euro Area
World
Rest of the World

Eurozone Debt Crisis

Gross Domestic Product, Q1-2008 = 100

Core = AT, BE, DE, FR, NL. Periphery = EL, ES, IE, IT, PT.

Core - US
Capital Flows, Crisis and Policy Distortions

- Model of international capital flows and crisis
  - Heterogeneous countries and Rest-of-the-World
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- Distortions on financial trade in the euro area
  - Effects on net and gross external positions
  - Transmission and severity of a debt crisis
Capital Flows, Crisis and Policy Distortions

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  - Heterogeneous countries and Rest-of-the-World

- Distortions on financial trade in the euro area
  - Effects on net and gross external positions
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- Quantitative model calibrated to euro area economies
Implicit Subsidies on EMU Asset Holdings

- Financial regulation
  - “Zero-risk weight” on €-denominated sovereign exposures
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- Bailout expectations
  - Rescue programs and non-standard monetary policy
Implicit Subsidies on EMU Asset Holdings

- Financial regulation
  - “Zero-risk weight” on €-denominated sovereign exposures
- Bailout expectations
  - Rescue programs and non-standard monetary policy
- Creation of single currency
  - Eligibility of €-government debt as ECB collateral
Outline of Results
Role of Subsidy on EMU Assets

- Expansion of gross external positions
  - Leverage of benefits of a subsidy
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Role of Subsidy on EMU Assets

- Expansion of gross external positions
  - Leverage of benefits of a subsidy
- Current account imbalances
  - Effects on borrowing costs and exposure to risk
- Transmission and amplification of a debt crisis
  - Tightening of cross-border financial linkages
**Key Model Elements**

- Two small open economies and rest of the world
  - Periphery ($H$), Core ($F$), $ROW$
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- Sovereign default risk
  - Limited commitment friction in Periphery
  - Periphery cannot commit to always repay debt
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- Trade in goods
  - One homogeneous good, freely tradable across all countries
  - Heterogeneous goods and trade integration will play important role in a crisis event
**Optimization Problem - Periphery**

- **Lifetime utility**
  \[
  u(c_1) + \beta \mathbb{E}[u(c_2)]
  \]

- **Period budget constraints**
  \[
  c_1 + q_H b_H = y_1
  \]
  \[
  c_2 = y_2 + (1 - D_H) b_H - D_H \zeta
  \]
  
  - Repayment
  - Default
  
  \[
  \zeta = \begin{cases} 
  \hat{\zeta} > 0 & \text{w.p. } \pi \\
  0 & \text{w.p. } 1 - \pi
  \end{cases}
  \]
Optimization Problem - Periphery

- Lifetime utility
  \[ u(c_1) + \beta E[u(c_2)] \]

- Period budget constraints
  \[ c_1 + q_H b_H = y_1 \]
  \[ c_2 = y_2 + (1 - D_H) b_H - D_H \hat{\zeta} \]

  \( \hat{\zeta} \) is the repayment
  \( \zeta \) is the default

- Limited commitment
  \[ \text{Default cost } \zeta = \begin{cases} \hat{\zeta} > 0 & \text{w.p. } \pi \\ 0 & \text{w.p. } 1 - \pi \end{cases} \]
Benchmark Undistorted Allocation

- Periphery faces high cost of borrowing
  - ROW-lender takes default risk into account
    \[ q_H = \beta \pi \]
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  - Constant endowment across periods
  - Optimal for Periphery not to issue or buy assets
    \[ b_H = 0 \]
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- Financial autarky is also optimal in Core
  - Flat endowment path implies no borrowing or lending motive
Benchmark Undistorted Allocation

$H$-Asset Supply

$|b_H|$

Demand for $H$-Assets by $F$

$b^*_H$

$0$

$q$

$b$

$\beta \pi$
Subsidy on Asset Holdings in the Economic Union

- Bailout promise offered to households in the Core
  - Households expect full compensation in the event of default by Periphery
  - Promise is offered to Core-households by the Core-government
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- Bailout transfers financed by all Core-households via taxation
  - Effects of asset purchases on taxation are not internalized
  - Individually, households perceive Periphery-debt as risk-free
Optimization Problem - Core

▶ Lifetime utility

\[ u(c_1^*) + \beta \mathbb{E}[u(c_2^*)] \]

▶ Initial-period budget constraint

\[ c_1^* + q_H b_H^* + q b_{ROW}^* = y^* \]

▶ Bilateral external positions

▶ Gross assets, \( b_H^* > 0 \)

▶ Gross liabilities, \( b_{ROW}^* < 0 \)
Optimization Problem - Core

- Lifetime utility
  \[ u(c_1^*) + \beta \mathbb{E} [u(c_2^*)] \]

- Initial-period budget constraint
  \[ c_1^* + q_H b_H^* + q b_{ROW}^* = y^* \]

- Bilateral external positions
  - Gross assets, \( b_H^* > 0 \)
  - Gross liabilities, \( b_{ROW}^* < 0 \)

- Terminal period
  \[ c_2^* = y^* + b_{ROW}^* + (1 - D_H) b_H^* + D_H (b_H^* - t^*) \]
  (Bailout promise)
Equilibrium with Subsidy
Current Account Deficit in $H$

$H$-Asset Supply $|b_H|$

Demand for $H$-Assets by $F$ $b_H^*$

CA deficit
EQUILIBRIUM WITH SUBSIDY
NET AND GROSS POSITIONS IN $F$

$H$-Asset Supply $|b_H|$

Demand for $H$-Assets by $F$ $b^*_H$

Gross assets

$q$

$\beta\pi$

$b$

Gross assets
EQUILIBRIUM WITH SUBSIDY
NET AND GROSS POSITIONS IN $F$

\[ F\text{-Asset Supply} \quad |b^*_{ROW}| \]

\[ H\text{-Asset Supply} \quad |b_H| \]

Demand for $H$-Assets by $F$

\[ b^*_H \]

Gross assets

Gross liabilities

CA surplus
Default Crises in an Economic Union

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  - Creditor country Core is the main destination of exports
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  - Result arises if Periphery specializes in goods not traded with ROW
Key Results In a Nutshell

- A bailout promise on risky assets generates in the model:
  - Expansion of gross positions in the Core
  - Widening of current account imbalances
  - Fall of borrowing costs for Periphery
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- In a crisis:
  - Transmission of crisis within economic union
  - Deeper recession in the Periphery
Quantitative Framework - Key Elements

- Infinite-horizon economy
- Continuum $I$ of heterogeneous countries
  - Idiosyncratic income shocks
- Limited commitment
  - Endogenous sovereign default a la Arellano
- Endogenous distribution of net-foreign assets
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- Infinite-horizon economy
- Continuum $I$ of heterogeneous countries
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- Endogenous distribution of net-foreign assets
- Compare stationary allocations with and without bailout promise on union-issued assets
  - Comparative static exercise
**Infinite-Horizon Economy**

- **Preferences**
  \[ U_i = E_0 \sum_{t=0}^{\infty} \beta^t u(c_{i,t}) \]

- **Resources**
  \[ \log(y_{i,t}) = (1 - \rho_y) \mu_y + \rho_y \log(y_{i,t-1}) + \epsilon_{i,t} \]
Infinite-Horizon Economy

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- Sovereign default
  - Each country has the option to repay or default on external debt
  \[ \text{Default if } V^D(y) > V^R(y, n) \]
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    \[ \pi (y, b') \in (0, 1] \]
Infinite-Horizon Economy

▶ Preferences

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\[ \pi (y, b') \in (0, 1] \]

▶ Asset price bid by risk-neutral ROW lender

\[ q (y_i, b_i') = q^{ROW} \pi (y_i, b_i') \]
Infinite-Horizon Economy with Bailout

- Bailout promise
  - Households who purchase risky gross assets receive a partial bailout promise from their government
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- Each country trades assets in one out of four possible ways:
  1. Default on external lenders
  2. Borrow from $ROW$
  3. Borrow from other countries in $I$
  4. Buy gross assets issued by other countries in $I$
**Infinite-Horizon Economy with Bailout**

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\[
\max \{ V^D, V^R, V^I, V^S \}
\]
Calibration Strategy

- Set Undistorted Economy to match European countries pre-EMU
  - Set default cost, re-admission and impatience parameters

- Key targets:
  - Average interest rate
  - Average net foreign assets
  - Standard deviation of current account

- Study implications of bailout promise for:
  - Current account
  - Gross external positions
  - Distribution of external assets
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Infinite-Horizon Economy with Subsidies

Debt Price

- $\hat{q}$, ROW-borrower
- $\tilde{q}$, I-borrower

$q$ vs. $-n'$, Bonds Issued
Infinite-Horizon Economy, Undistorted

Current Account

\[ n' - n \]

\[ n, \text{Net External Assets} \]

\[ y_{LOW} \]
\[ y_{MID} \]
\[ y_{HIGH} \]
Infinite-Horizon Economy with Subsidies

Current Account

\[ n', n \] vs. Net External Assets

-0.1
-0.05
0
0.05
0.1

\[ n' - n \]

\[ y_{LOW}, y_{MID}, y_{HIGH} \]
Infinite-Horizon Economy with Subsidies

**Net External Assets Distribution**

- **With Subsidies**
- **Undistorted**

![Graph showing net external assets distribution with and without subsidies.](image)
Infinite-Horizon Economy with Subsidies

Distribution Across Discrete Choices

- Saver
- ROW-b.
- I-borr.
- Default
Concluding Remarks

- Role of policy distortions in recent euro-area experience
  - Net and gross capital flows
  - Expansion of current account imbalances
  - Severity of debt crisis in an economic union

- Where to go next
  - Asymmetric effects on flows to private and public sector
    - Implications for aggregate productivity
  - Monetary policy and the € exchange rate
    - Heterogeneous effects on member countries
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- Thanks!
Infinite-Horizon Economy with Subsidies

Discrete Borrowing Choice

$n$, Net External Assets

$y$

$n$, Net External Assets

Default
Saver
$I$-borr.
$ROW$-b.
Infinite-Horizon Economy with Subsidies

Intermediation

\( \tilde{b}', \text{ Gross Assets} \)
\( n', \text{ Net Ext. Assets} \)
Infinite-Horizon Economy with Subsidies

Current Account

\[ n', n - n \]

\[ n, \text{Net External Assets} \]

\( ROW \)-borrower

\( I \)-borrower
Bilateral External Positions - Belgium

Bilateral Net Foreign Assets of Belgium

% of EA GDP

Partner

- Euro Area
- World
- Rest of the World

Bilateral External Positions - Germany

Bilateral Net Foreign Assets of Germany

% of EA GDP

Partner

Euro Area

World

Bilateral Net Foreign Assets of Euro Area Core

Bilateral External Positions - Periphery

Bilateral Net Foreign Assets of Euro Area Periphery

Partner

Euro Area
World

% of EA GDP


Back to France
Eurozone Debt Crisis

Gross Domestic Product, Q1-2008 = 100

Core = AT, BE, DE, FR, NL. Periphery = EL, ES, IE, IT, PT.

Core
United States
Average tradability of output - EU economies

Source: OECD STAN and TiVA databases, year 2005, and own calculations